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ORIGINAL ARTICLES

THE LIVER.*

By CHARLES F. PECKHAM, M. D.,

Providence, R. I.

Every human cell, no matter in what organ it may be found, has all the characters, functions and habits of every other human cell. So far as functions are concerned, it possesses every one in a greater or less degree, and it is the development of certain special functions and the suppression of others that gives the specialized cell its characters, and fits it for its duties in liver, spleen, gland or nervous system.

A liver cell may in consequence be defined as one specialized for secretion, excretion and digestion with the other functions peculiar to the primitive human cell repressed.

This conception of the human cell makes clear the multiplicity of function of the various organs and leads us back to the ovum, in the chromosomes of which all the various functions of the body are represented. Certain of these become dominant factors in certain cells in the same manner that the various dominant characters are transmitted in various species after the law of Mendel. It is therefore impossible for the progeny of the primitive liver cell to be anything but a liver cell, those of the nerve cell to develop into anything but nerve cells, and so on through all the types of cells found in the various organs.

It is possible to imagine an ovum in which the liver chromosome is absent or of so weak a vitality that it is unable to be the ancestor of enough hepatic cells to supply liver function for the body. This would naturally be a recessive character and would rapidly be eliminated from the strain. However, it does occur among animals, as occasionally a monster is born without liver cells or a child with so little liver tissue as to be unable to live. Little did Mendel realize as he raised his flowers in his garden, separated them into groups according to their characters, tabulated the results and established the law of dominant and recessive characters that his discoveries would be so widely applied to biology. His law is as great a blessing to humanity as those that govern the movements of the planets and of the atoms of the chemical compounds.

In the fine anatomy of the liver, nature has demonstrated her ability to construct a most beautiful, compact and efficient chemical apparatus. The manner of bringing the blood to be treated into contact with the cells, the method of bringing pure blood to the various cells for their proper nutrition and the system for the collection of the external secretions and excretions are still among the wonders of physiology.

Liver cells have an external and an internal secretion. The external secretion has long been known to medical men and to the population at large as the bile. It was regarded as purely a waste product in the early days of medicine and an increase in its secretion regarded as an evil omen. To-day its importance as the most powerful intestinal antiseptic known is fully recognized. Certain of its chemical constituents are absolutely necessary to conditions of intestinal health. Any failure of its production leads to an entire derangement of the intestinal function. Many of the conditions found in the intestines laid at the door of stasis, ptosis, kinks and catarrh arise in reality from the absence of some of its constituents alone and from no other cause.

Besides the tauro and glycocholic acids combined with sodium, potassium, magnesium and calcium, the bile contains many enzymes which digest, assist the action of the enzymes of the pancreas, stomach and mucous membrane of the intestinal canal, and also act as activators for other enzymes. The chemistry of the latter process is obscure, and still remains a problem to be solved.

The liver cells contain all the enzymes found

*Read before the Section in Medicine, Rhode Island Medical Society, February 27, 1917

in all the primitive human cells. As in all cells, these may be classified as metabolic and protective enzymes. Its metabolic enzymes are especially active, belonging to the proteolytic, amylolytic and lipolytic groups.

Its proteolytic enzymes reconstruct the various proteins absorbed from the intestinal canal in such a manner as to render them available for the nutrition of the general body parenchyma. This necessitates a reversal of the polarity of the protein body and a change of the arrangement of its radicals in space to correspond with the anatomic structure of human protein. These proteolytic enzymes also destroy the worn out human proteins from whatever source they may arise and the foreign protein arising from the death of bacteria, moulds and protozoa. They also destroy any proteins absorbed from the intestinal canal that are through their chemical nature unfit for the nutrition of the human cells. This enzmye is extremely active throughout the entire life of the individual and any suspension of its secretion leads to the most disastrous results. Without this process, recovery from the various infections, such as typhoid, malaria, influenza and kindred diseases would be impossible.

This enzyme also destroys the so-called protein split products, more especially beta-iminazolylethylamine arising from the battle between the cellular structure of the body in general, and invading parasites of various kinds. Slight impairments of its strength leads to an accumulation of foreign proteins in certain organs of the body, as in the joints in gouty conditions, in the skin in psoriasis and in the arteries in arteriosclerosis. These deposits in many cases show a tendency to calcify. If this function is further impaired, various complex chemical bodies, such as indican, skatol and the various organic acids, begin to appear in the urine and the patient departs from the condition known as good health. The suspension of this function leads to the condition that we all meet day after day in chronic degenerative conditions that we term uremia.

The chemical reactions brought about by this proteolytic enzyme are very complex. The end products of the reaction are in health urea, carbon dioxide and water. The suspension of the process naturally leads to a diminution of the amount of urea in the urine, and this for the very good reason that it is not in the blood stream for the kidneys to excrete. It is present, however, combined in the body of the unconverted foreign proteins. These unconverted proteins and protein products are extremely poisonous.

The matter of the protein poison or poisons in the causation of disease is one of extreme importance. A concise statement of the facts of the case may be of interest. Let us reduce the problem to one of pure chemistry.

In the structure of all proteins, the existence of the primitive protein molecule or building block, known as beta-iminazolylethylamine, is assumed, arranged in combinations with the hydroxyl molecule in greater or less number and with geometrical symmetry in space, and the variety of the proteins met with throughout the animal and vegetable kingdoms is thus accounted for. Proteins can exist in the form of colloids, crystalline bodies or even in the gaseous state. In the internal change that takes place when a protein of one kind is converted into that of another, one of two things happen, —a hydroxyl molecule is extruded or included, or a beta-iminazolylethylamine molecule added or taken away. The hydroxyl molecule is of little moment in disease, but the beta-iminazolylethylamine molecule, on account of its great affinity for other proteins and the ease with which it enters into chemical combination with them, is a poison of the greatest potency.

As the proteins of animals and vegetables vary, so the proteins of the different organs of these organisms vary. For example,—the organs of man all contain human protein in their structure, yet the protein of the liver cell is not chemically identical with the protein of the kidney cell; the proteins of the cells that go to make up the skin vary slightly according to their location; that of the lymphocyte differs slightly from the polymorphonuclear leucocyte and that of brain cells from that of cardiac muscle. In all probability, the proteins of organs of the same function vary chemically in different individuals. The protein of one man's liver, while classed as human hepatic protein, may be slightly different in chemical structure from his neighbor's and react in a different manner under the attack of disease. There is one notable exception to this, however, and that is the protein body found in the crystalline lens. The compo-

sition of this protein is remarkably constant in all animals.

There is a marked chemical difference between living and dead protein. This has more especially to do with the number of hydroxyl radicles that the protein body contains. Protein death may be defined as the extrusion of hydroxyl molecules.

Every living cell in the universe elaborates a certain chemical body either in its cell substance or upon its surface that has the power of converting certain proteins or groups of proteins into proteins of its own composition and polarity. These are termed ferments or enzymes. Some of them add hydroxyl molecules, others subtract them, others reverse polarity, and still others rearrange the beta-iminazolylethylamine molecules, extruding those that are unnecessary in the new protein compound. The latter enzymes are in consequence the more active in individuals showing the symptoms of disease.

A microörganism to be pathogenic must produce an enzyme capable of changing the protein of its host into its own special protein. If this is not so, it has no power of attack, and cannot be pathogenic. For example, dogs do not have typhoid fever, because the bacillus typhosus cannot digest canine protein. Other microorganisms may digest canine protein and be unable to invade human beings. Others, such as the microörganism of rabies, may digest the proteins of several different genera of animals.

Parasitic microörganisms may be divided into two groups,—those which depend upon a poisonous body which they secrete from their body surface to kill the tissue upon which they are to feed and to resist the attacks of the phagocytes, and those that, secreting no toxin, cause so little disturbance that their presence is not suspected until the tissues of their host have been completely invaded and greatly damaged. The diseases caused by parasites of the first group are usually local in character and of a mild nature, but the parasites of the second group have caused humanity untold suffering and misery. In the first group belong such diseases as diphtheria, furunculosis and gonorrhoea. To the second, such terrible diseases as syphilis, typhoid fever, malaria and pneumonia. In the first group it is the living microörganism that does the harm, in the second it is the dead that causes the trouble.

The foreign proteins that may be present in the tissues of the body may arise from the growth of microörganisms in the tissues of the host or be absorbed through some of the mucuous surfaces of the body. Probably in every individual a certain amount of foreign protein appears in the circulation after every meal, is digested, parenterally by the body cells and the split products of such digestion, destroyed by the liver and cast off through the kidneys with no disturbance to the general welfare. There are certain people, however, in whom the power of digesting certain protein commonly present in the ordinary dietary of society is very limited or absent. These individuals have learned by experience to avoid certain articles of food. Their disagreeable symptoms do not arise from the presence of any of the so-called split products of protein digestion, such as beta-iminazolylethylamine, but through the poisonous effect of unchanged foreign protein in their blood stream and the special affinity of this for some of their organs; for example, their skins or mucous membranes.

The phenomena known as sensitization and anti-sensitization, often termed anaphylaxis and anti-anaphylaxis, have a great bearing on the case when the protein present in the tissues is the result of the growth of microörganisms This phenomenon has to do with what might be called the psychology of the individual cells of the body. In the case of the microörganisms of the second class, the invader does not at first cause much disturbance, the waste products of his metabolism are taken care of by the organs of the host, the food that he consumes is not a matter of great moment, the irritation that he causes in his growth and activity are mechanical and not chemical in nature, and he is stealthily building up his own tissue at the expense of his host. All goes well until members of his colony begin to die of old age and the tissues of the host find themselves called upon to deal with the nuisance of dead foreign particulate protein. In the destruction of this protein nature is too economical. The cells of the host digest it and turn it back into human protein. In this process, however, the waste building blocks, in other words, the beta-iminazolylethylamine molecules, are set free in the circulation to produce symptoms of intoxication or disease. When the cells of the body have acquired the power

of digesting this form of protein, they are said to be sensitized or anaphylacticised. In other words, they have learned to recognize and convert this special protein into a protein of their own chemical composition. As the capacity of each cell for accomplishing this result has its limitations, enough foreign protein can be applied to these cells to completely exhaust this function. This cell is then said to be in a state of sensitization exhaustion, or anti-anaphylaxis. It will return to a state of normal sensitization or anaphylaxis if allowed to rest.

The rapidity with which sensitized cells digest dead protein is remarkable. In a dog sensitized to egg albumen, ten cubic centimeters injected into the circulation will, according to Vaughan, be digested in thirty seconds, but with the death of the animal from beta-iminazolylethylamine intoxication in an equal interval of time.

This process may be observed in burns of the second degree. The application of heat turns the superficial layers of skin into dead protein. As this protein is of no longer the same chemical composition as normal human protein, having been hydrolized by heat, it becomes a foreign protein. As all the cells of the animal kingdom are sensitized against their own dead protein, digestion proceeds at the junction of the dead and the living cells. Serum is secreted to dilute the beta-iminazolylethylamine resulting from this digestion. When one considers the rapidity of this process and also the amount of force that would be required to raise the bleb by directly applied tensile force, the process seems remarkable.

Living particulate protein,—the bodies of microörganisms that can digest human protein, are never attacked by the cells of the body. If this were not the case, the temperature chart of typhoid infection would show a line starting at 98.6 degrees F., dropping several degrees within an hour, with sudden death resulting from sensitization shock. Reinfections and relapses would also be impossible.

So also in malaria infection the onset of the symptoms would correspond with the completion of the sensitization of the body cells and not with the accumulation of dead protein, the result of the segmentation of the plasmodia. The regularity of the schedule upon which these diseases run leads to the conclusion that other factors than protein parenteral digestion must be in operation.

The symptoms of typhoid fever, including the characteristic temperature chart, may be produced in any animal that has been properly sensitized to any of the numerous known proteins; egg albumen, for instance, by the repeated injections of the protein in appropriate doses. The same train of symptoms may also be produced by injection of some of the protein split products in unsensitized animals. The protein used in these experiments is, however, dead and not living.

Dead protein, on the other hand, is digested by the unsensitized cell slowly, or, in the case of the sensitized cell, with extreme rapidity.

To apply this fact to typhoid fever as it is usually observed we must either assume that after sensitization has taken place there is some factor in the life history of the invading colony of bacteria or in the tissues of the host that accounts for the regularity of the course.

Assuming that the cells become sensitized to typhoid protein on about the fourteenth day after infection, or at the first appearance of febrile symptoms, there must be a constantly increasing daily production of this protein for two weeks, followed by a decreasing daily production for an equal period. The symptoms of rapid parenteral digestion noted in animal experimentation is never observed. To capitulate, the course of a typhoid infection may be divided as follows:

Incubation—(1) Period of developing sensitization	14 days
Incubation and Fastigium—(2) Period to full development of colony	28 days
Defervescence—(3) Period of degeneration of the colony	14 days
No. 1 + No. 2 + No. 3—(4) Life of colony	42 days
No. 2 + No. 3—(5) Period of protein digestion	28 days

The length of time that a colony of typhoid bacilli can exist in the human body is not definitely known. The number of typhoid carriers that are present in the community, however, leads to the belief that it may, in some cases at least, be indefinitely.

On the other hand, the tissues of the body have other effects upon the growth and development of the colony that cannot be explained upon the theory of protein digestion. For instance, the phenomena of clumping and phago-

cytosis and the presence of specific antibodies and opsonins in the sera of the hosts have an important bearing upon the course of the disease.

It is well to bear in mind that symptoms of intoxication arise from the presence of dead and not living protein.

The symptoms of protein intoxication may be divided into two main groups;—first, those met with in individuals who are unsensitized or in whom sensitization is exhausted; second, those present in sensitized individuals. In other words, first, in conditions of anti-anaphylaxis, or in an undeveloped anaphylaxis and second, in conditions of anaphylaxis. These again may be subdivided as acute and chronic symptoms.

Without the amylolytic enzymes, the carbohydrates would be unavailable as a food supply. This type of enzymes may be classed as constructive and reducing, according to their action toward glycogen. The chemical process here seems principally to be one of inversion, and the first of these enzymes may be regarded as an invertase. In other words, the carbohydrates are inverted into glycogen or "animal starch" in order that it may be conveniently stored for future use. This is a parallel biochemical reaction to that which takes place in the vegetable kingdom with the storage of starch in leaves, bulbs and roots.

In certain livers this enzyme is absent or so reduced in amount as to be unable to invert all the carbohydrates eaten by the individual. In this case, so much of the sugar as the cellular structure of the body is unable to invert, and every cell has this function in a certain degree, becomes a waste product and is carried off by way of the kidneys.

The second enzyme reverses the polarity of the stored glycogen and renders it available for the nutrition of the cells of the body. Its action on glycogen may be termed reduction—inverting. If this enzyme is absent or reduced in amount, glycogen in turn becomes a waste product as soon as the capacity for its storage becomes exhausted, and appears in the urine.

The chemical process involved in the utilization of carbohydrates in the animal and vegetable kingdoms is one of unfailing interest. The source of all the carbohydrates that animals consume is the carbon dioxide of the atmosphere. This gas, through the enzyme present in the chlorophyl body of the plant, is converted into sugar. Sunlight is absolutely essential to this chemical reaction. In this process, most of the oxygen is set free and is exhaled into the atmosphere. This sugar is either consumed in the metabolic activity of plant cells or inverted into vegetable starch and stored for the future needs of the vegetable organism. In our demand upon the vegetable kingdom for carbohydrates, we take advantage of the fact that it is the habit of plants to store food in the form of starch for the use of the succeeding generation. Thus we find seeds, tubers, roots and bulbs all great storehouses of starchy materials which we divert for our own nutrition.

There is a marked analogy between the chemical processes in carbohydrate metabolism in plants and in animals. The great difference, however, lies in the reversals of the polarity of the various starches and sugars. The polarity of the human cell is uniformly positive, or right; that of the vegetable cell, negative or left.

Bearing this in mind, let us trace the sugar produced by the carbondioxide-chlorophyl-actinic ray process in the plant and in the animal.

The plant sugar is of right, the vegetable starch is of left. Therefore the vegetable cell being of left polarity cannot directly attack starch without the aid of an enzyme to invert polarity—in other words, an invertase.

Vegetable starch by the amyolytic enzymes in the intestinal canal is changed to a sugar of the left polarity, thus becoming a source of food for the animal cells whose polarity is right, without the aid of any further chemical treatment. For purposes of storage, however, its polarity must be again reversed. This process, which takes place through the action of the constructive invertase mentioned above, gives rise to glycogen, or animal starch of right polarity, and this is not available again for cell nutrition without the action of an invertase to convert it into sugar.

The edible oils and fats may be classified as follows according to their acid radicals:

1. *Stearic Series.* $C_n H_{2n+1} COOH$
   Butter, Lard, Palm oil, Cocoanut oil, Cocoa butter.
2. *Oleic Series.* $C_n H_{2n-1} COOH$
   Croton oil, Olive oil, most fats or oils.
3. *Linolic Series.* $C_n H_{2n-3} COOH$
   Linseed oil, Cotton seed oil, Corn oil.

4. *Linolenic Series.* $C_n H_{2n-5} COOH$
Linseed oil, Cod liver and Fish oils.

5. *Ricinoleic Series.* $C_n H_{2n-7} COOH$
Castor Oil

Glycerine or Glycerol $= CH_2OH - CHOH - CH^2OH$

These all combine with glycerine to form oils of corresponding series. As glycerine has three radicals that must be satisfied, three molecules of the various fatty acids must be present in the fatty molecule. These are known as triolein, tristearin, tripalmatin, etc. These acids need not be all of the same kind in the fatty molecule. This leads to the formation of the so-called mixed glycerides, such as oleodipalmitin, steareodipalmatin, or such complicated compounds as oleopalmito-stearin. Many of these mixed glycerides give certain fats, such as turkey and goose fats, their character.

Now, human fat is a mixture of stearin, palmatin and olein. The problem that the liver has to solve deals with the building up of some molecules and the reduction of other fatty molecules so that they can find their place in the human economy. This process is lacking for certain kinds of fats in some individuals and is usually accompanied by a marked distaste for these fats and oils.

The hydrogen value of the fats and oils commonly consumed by human beings lies between 127, in the theobromic acid found in cocoa butter, and 11, in the caproic acid of ordinary table butter. It is questionable if fats with a value much over 50 can be digested by the average human liver. Peanut oil, containing linoceric acid, H-47, is the highest that is commonly used as an edible oil. Now, the oleic acid radical contains H_{32}, the palmitic acid radical contains H_{31} and the stearic acid radical contains H_{35}. Therefore the hydrogen value in human fat lies between 31 and 35, and all fats and oils taken in the food must be either hydrogenated or dehydrogenated so that their hydrogen value will fall within these limits.

These reactions take place through the action of ferments termed hydrogenases. They are of two kinds so far as fatty acids are concerned—hydrogenase a, or constructive hydrogenase, and hydrogenase b, or reducing hydrogenase. They belong to the class of ferments known as lipases, which are widely distributed throughout the body. Some of these lipases saponify fats, others replace certain radicals in the fatty molecule with phosphorus, producing the special form of fat found in the nervous system.

One more enzyme that is intimately connected with the metabolism of fats in the liver deserves especial mention. This is oxidase, and without it the fats we store would remain so and could not be again utilized as fuel by the tissues. This is often reduced in amount or even absent. The latter condition we recognize as the disease termed obesity. In other words, the power of assimilating and storing fat is unimpaired, the power of reducing it again is impaired or lost.

The question of the conversion of protein, carbohydrate and hydrocarbon into one another is one of extreme interest and presents a problem that still awaits solution. The evidence pointing to the conversion of protein into carbohydrate and the latter into protein in the human body is very weak, although in certain bacteria and protozoa, complicated protein molecules containing a carbohydrate molecule are often found.

Evidence pointing to the conversion of protein into hydrocarbons is perhaps stronger, but it is questionable if this takes place to any great extent in health at least.

The conclusion seems logical that nearly all the protein required by the body must be consumed as such. If such a process does take place, we must assume the presence of the following enzymes: Proteo-carbohydratase, proteo-hydrocarbonase, carbohydro-protease, and hydrocarboprotease, in the human cell.

Regarding the carbohydrates and hydrocarbons, the first group is regularly converted into fats, but the second group is probably reduced and oxidized through oxidase and its energy directly utilized, without conversion into carbohydrates. The enzymes used in this process belong to the family of the oxidases and hydrolases.

If the liver or any other organ be deprived of its blood supply and kept at body temperature, it softens and finally becomes liquid. This is a fact that is well recognized by dealers in meat products, and is carefully guarded against through proper refrigeration. In the case of liver, kidneys, or other internal organs of beeves, calves, and pigs, a marked disagreeable flavor results, and the food is spoiled for human consumption. In the case of muscle tissue, this flavor does not

develop and we say that the meat is properly seasoned.

This process takes place through the agency of a proteo-invertase, and it is a very wise provision of nature inasmuch as it facilitates the digestion and removal of any liver cells that have been killed in their battle with disease.

Now, every human cell secretes enzymes that are thrown into the general circulation. In certain of the internal glands, such as the thyroid, the adrenals, the thymus, and the pituitary body, they are of the utmost importance to the proper nutrition, development and well being of the bodily tissues. We recognize in certain diseased conditions an increase or a diminution in the production of these enzymes as a causative factor.

Some of these bodies have a selective and irritating action on certain organs, but, on the other hand, every cell feels this effect to some extent. Therefore every human cell must have a means of protecting itself against the enzymes of other cells. These bodies that neutralize the enzymes arising from other cells and protect the cell from attack are termed protective enzymes.

This leads us to the consideration of what might be termed the enzyme balance. This balance is often disturbed after operative procedures involving the removal of some internal organ. This is beautifully illustrated in the syndrome that we recognize in the female as the menopause. Without going into the finer chemistry of the process, the symptoms noted may be easily explained through the accumulation of ferments in the tissues that formerly were neutralized by the protective enzymes of the organ removed, and their attack upon the cells of the nervous, circulatory and other systems. As we well know, the re-establishment of this balance may be a matter of years.

As a conclusion to these remarks, I may be permitted to refer again to the so-called disorders of the storage system.

As you have heard about the metabolism of proteins, carbohydrates, and hydrocarbons, the fact is that there is a marked analogy in the treatment of these three important classes of food in the body. The first step in the process is fairly well understood. I mean by this, their conversion by the aid of enzymes into bodies of the proper chemical composition and of the proper polarity to fit the structure of the human cell.

Nature, on the other hand, is too thrifty in her habits to live from hand to mouth. Neither are the tissues of the body able to appropriate the amount of food taken into the body at a single meal without some means being provided for storing the surplus for use during the period elapsing between the first meal and the time when the second becomes available.

This leads to a realization of the important office the liver holds, I might say, as the quartermaster of the body, with full control of its marvelous storehouses of food.

Two derangements of this service may take place,—either the road to the storehouse may become blocked, or delivery from the storehouse may become impossible.

In the first case, a general malnutrition with a great loss of weight and symptoms corresponding to the wastage of proteins, carbohydrates and hydrocarbons either singly or in groups will be found. In the second, great accumulation of proteins, carbohydrates and hydrocarbons which are absolutely valueless to the individual and which may prove a source of danger, such as we find in gout, diabetes of some types, and obesity.

A STUDY OF CARDIORENAL TYPES.*

By H. P. Lovewell, M. D.,
Providence, R. I.

The topic chosen is based upon a review of two hundred and fifty cases that had accumulated during a course† in "Medicine and Pathology" given at the Massachusetts General Hospital during the past six years. In order to have some scheme as a working basis for tabulating these cases I adopted the classification of Dr. R. Cabot as suggested by him in a paper read before the American Medical Association in 1914. He found in a study of six hundred cases of failing heart, that 93 per cent. could be arranged in four groups, the rheumatic, nephritic, arteriosclerotic and the syphilitic.

Of the cases studied, I have tabulated seventy under one or the other of these four types.

In the time allotted it is impossible to do justice to all these divisions. I wish to speak principally of the glomerulonephritic type and com-

*Read before The Providence Medical Association, October 2, 1916.

†Drs. W. H. Smith and O. Richardson Course.

Sex.	Age.	B. P.	Ht.	Wt.	Kidneys Wt.	Alb.	Casts.			Oedema.
M	74	165/110	550	217	S.T	H.G.	1020 1024			Mod.
F	60	260/140	466	290	L.T	G.	1016			N.
M	37	220/140	705	290	NONE	N.	1016 1028	R.		+ Cardiac.
M	68	210/125	728	253	T.	MANY	1015			Soft.
M	46	245	410	165	L.T.	N.	1008	Alb. Ret.		N.
M	45	164/92	251	275	T.	N.	—			Sl.
M	56	120	705	265	S.T.	G.	1010			Marked.
M	56	175/140	625	400	T	H.	1021	Fundi Art. Scl.		Mod.
M	46	220/173	710	570	L.T.	H.G.	1010			N.
F	60	210/150	444	191	T.	N.	1010	Wassermen ++		Sl.
M	63	105	548	275	S.P.T.	H.G. F.	1030			Marked.
M	68	160	390	272	S.P.T.	Few	1020	"Fits" 18 Yrs.		+
F	71	135/80	457	276	NONE	N.	1020	Syph. 30 yrs.		N.
F	35	130	450	250	V.S.T.	H.G.	1015 1022			Mod.
M	59	190	720	205	L.T.	N.	1006	Alb. Ret.		Lids.
M	57	170/110	718	325	V.S.T.	R.	1020			Mod.
M	47	262/170	700	450	T.	N.	1016			
M	70	150	480	483	S.P.T.	F.	1033			
F	50	120/70	442	282	—	—	—			N.
M	61	210/135	535	215	T.	N.	1008 1012	Fundi Art. Scl. & Hem.		N.

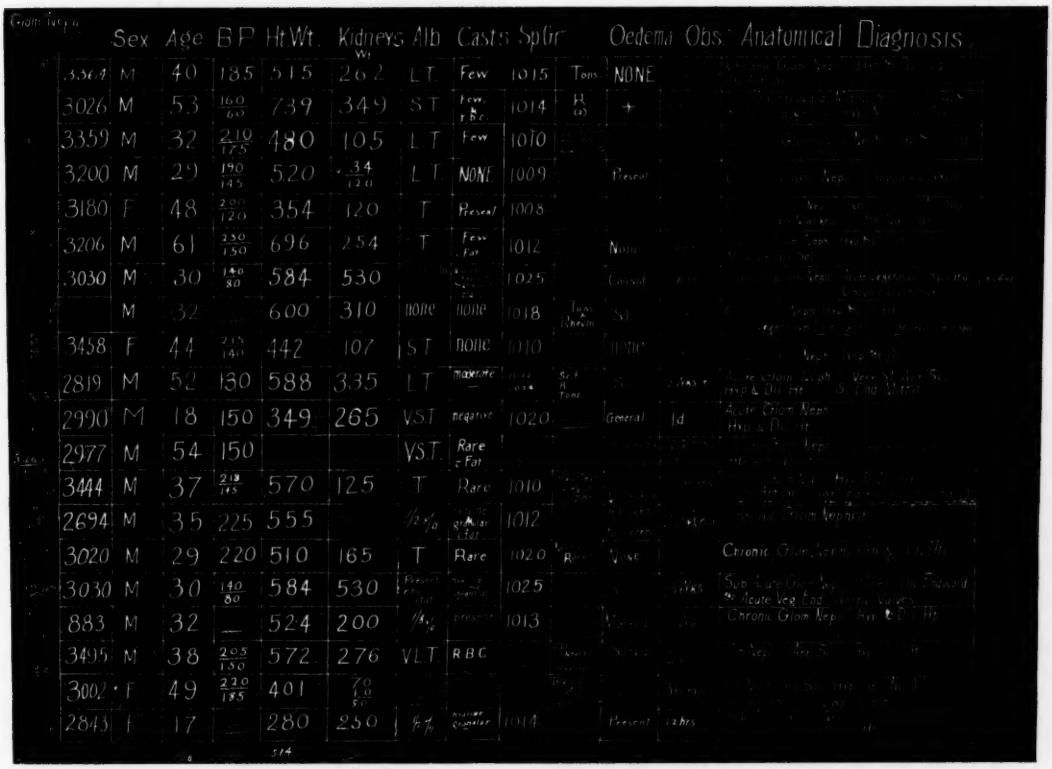
STUDY OF CARDIORENAL TYPES—ARTERIOSCLEROTIC GROUP

pare this in a way with the arteriosclerotic class.

As regards the terminology of nephritis, I have followed the teachings of Dr. Mallory. He says the toxic lesions of the kidney are best classified on an anatomic basis, i. e., according to the part of the renal unit involved.

This classification gives four groups which form the type lesions; they are as follows:

1. Tubular Nephritis.
2. Capsular Glomerulonephritis.



	Sex	Age	BP	Ht Wt	Kidneys Wt	Alb	Casts	Sp Gr	Oedema	Obs	Anatomical Diagnosis
3564	M	40	185	515	262	LT	Few	1015	Toes	NONE	
3026	M	53	160/60	739	349	ST	Few r.Bc.	1014	R Leg	+	
3359	M	32	210/175	480	105	LT	Few	1010			
3200	M	29	190/145	520	234/120	LT	NONE	1009		Present	
3180	F	48	200/120	354	120	T	Present	1008			
3206	M	61	230/150	696	254	T	Few Fat	1012		None	
3030	M	30	140/80	584	530			1025			
	M	32		600	310	none	none	1018			
3458	F	44	215/140	442	107	ST	none	1010			
2819	M	52	180	588	335	LT	moderate				
2990	M	18	150	349	265	VST	negative	1020		General	Id
2977	M	54	150			VST	Rare Fat				
3444	M	37	218/145	570	125	T	Rare	1010			
2694	M	35	225	555				1012			
3020	M	29	220	510	165	T	Rare	1020			Chronic
3030	M	30	140/80	584	530			1025			
883	M	32	—	524	200			1013			
3495	M	38	205/150	572	276	VLT	RBC				
3002	F	49	220/185	401	270/120						
2845	F	17	—	280	250			1014		Present	12 hrs

STUDY OF CARDIORENAL TYPES—GLOMERULONEPHRITIC GROUP

3. Intercapillary Glomerulonephritis.
4. Vascular Nephritis (Arteriosclerotic).

The older classification using the terms parenchymatous and interstitial, is not in harmony with what you find at autopsy. Pathology shows us that arteriosclerosis causes a deprivation of blood in the parts involved, and the end process is much the same as in the glomerular type. It is an aid to a clearer understanding of both the arteriosclerotic and the glomerular types to bear in mind that in each case the fundamental lesion is a vascular one.

In any lesion of the kidney you are going to get parenchymatous involvement. Tuberculosis causes great increase in interstitial tissue, so also pus and syphilis. Many lesions in kidney not a nephritis cause a nephritis of the interstitial type. Only one chemical poison that results in an interstitial process, and that is lead. Many of these cases of the glomerular type are due to some profound toxin, some soluble poison circulating in the blood.

Blood pressure readings furnish us with valuable data in a study of these types, but they must be interpreted in relation to other physical signs. The insurance companies have accumulated a vast amount of statistics upon which to base normal blood pressure averages at different ages. How widely any given blood pressure may depart from the average and still be within the limits of the normal has not been definitely determined, but it may be accepted as probable that a variation of about 12 per cent., either above or below the average systolic pressure, is still within the limits of the normal. At age of 60 a blood pressure as high as 150, or as low as 118,

may be accepted as coming within the normal limits. The pulse pressure should range from 35 m. m. to 40 m. m., whatever may be the systolic pressure.

Observations of the systolic pressure alone are of relatively little value. The diastolic pressure is the real indication of the work the heart has to do. This is a more constant factor.

In primary cardiac disease we may have low tension even when considerable renal disease has been superadded.

In primary arteriolar and renal disease, even when cardiac failure has advanced considerably, arterial tension is likely to remain high.

Reduction in blood pressure is often less real than apparent, because too frequently the systolic pressure alone is considered.

The systolic may drop from 180 to 130 or lower. In this type of case the important point is that the diastolic figure has remained quite constantly at 110 or 115 m. m. Such diastolic values in cardiorenal cases suggest arteriolar or renal disease rather than primary cardiac disorders. In the cases reviewed the average blood pressure in the glomerulonephritic group was 187.5 m. m., in the arteriosclerotic group 181 m. m. This difference, although slight, assumes greater importance when we note that the average age of the glomerular patient is twenty years less than that of the sclerotic type.

In these cases of hypertension you may find upon physical examination a murmur at the apex. Stengel says that in primary mitral regurgitation the systolic murmur always occurs in the early part of the systole, while in the mitral leakage following high tension, the murmur is so late in systole that the first sound is heard an appreciable interval before the murmur and the second sound follows immediately after the murmur. A late systolic murmur of this type is almost always significant of beginning cardiac failures in cases of hypertension.

Renal Function Tests: According to experiments by Tileston and Comfort,[1] the total non-protein nitrogen in the healthy fasting adult varied between 22.9 and 25 m. g. per 100 c. c. of blood, and the urea nitrogen between 12 and 14 m. g. They conclude that the estimation of the total non-protein nitrogen is a great aid in the prognosis of chronic nephritis, and that patients showing over 100 m. g., with one exception, did not live more than 35 days. Uraemic cases usually show decided increase in both nitrogen and urea. Urea nitrogen may be converted to urea by multiplication, using index 2.14.

F. C. McLean[2] decides that the absolute amount of urea in the blood cannot be taken as evidence of "nitrogen retention," because in many nephritics it does not differ materially from normal individuals. For the determination of urea in human blood or urine we should recommend the urease method as modified by Van Slyke and Cullen.[3]

F. W. Peabody in a paper read at the June meeting of the Massachusetts Medical Society[4] stated that the group of cases in which the tests have proved themselves to be of the most practical value is that which consists of chronic nephritis associated with vascular hypertension and cardiac hypertrophy.

"In that other group of cases usually marked by great oedema, oliguria, absence of cardiac hypertrophy, low blood pressure, and large amounts of albumin in the urine, the type generally referred to as chronic parenchymatous nephritis; the functional tests are of much less significance."

"In cases with cardiac failure, all tests in which the urinary output is a factor are liable to give unsatisfactory results, and it is only after compensation has been restored that an accurate picture of the renal condition is obtained."

Widal has demonstrated the close relationship that has existed between sodium chloride excretion and the production of oedema and of the association of chloride retention with chronic parenchymatous nephritis.

Under certain test diets there is evidence which indicates that certain abnormalities of urinary excretion may occur quite early in the course of a nephritis. Mosenthal has demonstrated this by some very practical tests.[5]

One type of test for renal function is the comparison of the concentration of a given substance in the blood with the rate of its excretion in the urine. The relation between the concentration of urea in the blood and rate of excretion is known as the "Ambard Coefficient."

At the Peter Bent Brigham Hospital this method is considered much more reliable than all the methods which consist of blood analysis

alone, "for high blood values may be associated with a normal rate of excretion, and, on the other hand, normal blood values may be found when the urea index indicates a very low functional capacity of the kidneys."[4]

The "red color test" appears to be very reliable except in those cases where any of the tests of renal function may fail. Regarding the "red color" test as compared with the blood urea tests at the Rhode Island Hospital, those with a high blood urea had a comparatively low "red color" test, highest blood urea was about 900. m. m. g., lowest blood urea about 405. m. m. g., to 1000. c. c. of blood.

In some quarters the non-protein or incongulable nitrogen alone had been employed as a test of kidney activity, while in others the urea has been utilized. McLean has emphasized the value of a comparison of the urea of both blood and urine, somewhat after the method employed by Ambard. Jonas and Austin in a recent article state that "for purposes of ordinary clinical diagnosis and prognosis the estimation of blood urea is a more reliable and more useful guide than is the urea index or the Ambard quotient."

In the cases studied the average heart weight in the glomerulonephritic type was 514 grams, the average arteriosclerotic type was 551 grams.

Cabot says cases of glomerulonephritis lasting over six weeks usually show some hypertrophy. It is of clinical importance to have patient lie on left side in order to locate apex beat in many of these cases.

All the cases tabulated in glomerulonephritic group showed some heart hypertrophy. It can be assumed that all hearts above 400 grams in weight are hypertrophied, but many under this weight also show enlargement.

We have been taught to associate chronic renal disease with cardiac hypertrophy, but there is another side to this picture. Several years ago the writer reviewed the autopsy records of one of the Boston hospitals, taking the first twenty-six cases in which the autopsy diagnosis was chronic interstitial nephritis; in six of these cases (twenty-five per cent.) there was no evidence of cardiac hypertrophy. Thus clinically we are not justified in ruling out chronic nephritis, because we do not find positive signs of cardiac enlargement. The association of left ventricular increase with renal involvement seems frequent, yet Lewis states that a nephritis should cause a symmetrical increase of both right and left ventricles.

Concerning the duration of symptoms in the glomerulonephritic type, in eight cases it was six months or under; in eight cases one year up to twenty years, and ten days the shortest of these cases.

Haemoglobin: Four cases showed 90 per cent. Hg., and in twelve cases it was 80 per cent. or over, and in three cases 85 per cent. In only four cases was Hg. under 80 per cent.

Leucocytosis: Eight cases showed a decided leucocytosis, the lowest 8,600 and highest 35,000.

It is quite common to find a leucocytosis in these cases and to get a rise in temperature a few days before death and think of some terminal infection, and yet the autopsy reveals no acute process to explain this. This applies to the arteriosclerotic group.

Retinitis: Many of these cases show a neuroretinitis, hemorrhagic retinitis, or an albuminuric retinitis. Any of these conditions may be found in either the glomerulo or the arteriosclerotic types.

Dr. F. T. Rogers on "Significance of Retinal Hemorrhages",[6] states that he was able to trace the subsequent histories of one hundred and eighty-seven cases of retinitis. Seventy-four were living and one hundred and thirteen dead. He calls attention to the fact that it is the hemorrhagic retinitis which yields the larger percentage of the cases of poor health.

Of the fatal cases seventy-five were diagnosed as nephritis. Of these thirty-eight (practically one-half) died within six months.

Not all cases of nephritis show a retinitis, probably twenty-five percent. of them do have some changes in the fundus that the ophthalmologist may recognize.[7]

Kidney Weight: The average in the glomerulonephritic group is less than in the arteriosclerotic group. (245 grams for glomerulonephritic) (297 grams for arteriosclerotic group). Osler says that the arteriosclerotic kidney as a rule is larger than the glomerulonephritic one.

A kidney weighing 400-500 grams usually means nephritis but sometimes oedema.

Microscopical examination of kidney in glomerulonephritis may show capillaries in glomeruli solid; they are choked up. One case (man aged 54), showed seven choked glomeruli in one field.

A picture of the chronic glomerular type shows the capillaries breaking up. It is common to find an increased size of the glomeruli and cortex gone.

Color of the kidney is somewhat dependent upon heart condition. The arteriosclerotic type may be a little red kidney, more adhesions of the capsules in arteriosclerotic, and redder tissue. Broken compensation may cause bluish-red color, anaemia is also a factor.

As regards casts, Barringer's study of life insurance statistics[8] show that the persistent presence of granular casts indicates a high probability of progressive renal and arterial disease.

We should watch for a tendency towards nocturnal polyuria or to fixation of specific gravity as these are danger signs. These point to beginning inability of the kidney to concentrate urea, and therefore indicate anatomical damage which has reached the stage of seriously compromising the large factor of safety of the kidneys.

A number of years ago the medical director of a large insurance company gave out the following statistics calculated from the records of at least two companies.

IMPAIRMENT: Approximate yearly mortality per 10,000 lives. (X)

1. Small amount of albumen and occasionally hyaline casts, otherwise first class. (This group is composed chiefly of simple albuminuria cases.) 137
2. Small amount of albumen and casts, other than hyaline, other first class.....220

(X) Average mortality among sound lives being 100

ALBUMEN—conclusions, (Barringer).

Renal albuminuria without casts is most frequently found in young adults. It is exceptional for it to be a symptom of incipient nephritis. It is rather to be regarded as an evidence of a generally lowered resistance which presupposes to tuberculosis infection. The mortality among these people is higher than among normal subjects.

SUMMARY. The difference in age between the glomerulonephritic and the arteriosclerotic patient is quite marked, the nephritic being 20 years younger than the sclerotic. Both types show cardiac enlargement. Disorders of the heart rhythm are more frequently associated with the arteriosclerotic class, so also cerebral hemorrhage.

Uraemic manifestations occur in the glomerular group, altho convulsions were noted but once in this series of cases. Pallor is more marked in the nephritic type, yet the haemoglobin scale does not always indicate the severity of the anaemia; venous congestion is the probable explanation of this discrepancy.

Valvular lesions are more common in the sclerotic than in the glomerular class.

A study of these cases shows the impossibility of always determining the exact weight or size of the heart from the usual methods of physical examination. This is in part due to the difficulty of estimating the exact degree in which hypertrophy or dilatation preponderates.

The blood pressure averages higher in the nephritics than in the arteriosclerotics.

It is evident that a high blood pressure is not always evidence of cardiac sufficiency, and may be accompanied by definite signs of cardiac failure. If improvement occurs, the pressure may rise or fall; as death approaches, it may rise or fall.

The cardiac sounds are not always to be relied upon. The second aortic sound may be weakened with failure to such a degree as to be within normal limits, altho it is usually accentuated.

Many cases in the glomerular group also show varying degrees of arteriosclerosis, and in any large series of cases there would be found many patients of the border line type in whom an exact diagnosis could not be made until an autopsy revealed the real anatomical lesion.

The more we study these groups, the more problems of interest arise. We believe that future studies along the line of renal function tests will enable us to diagnose kidney lesions earlier, and in that way suggest treatment that will prolong the life of the patient.

REFERENCES.

1. TIELSTON AND COMFORT, "The Total Non-Protein Nitrogen in the Urea of the Blood in Health and Disease." Arch. Int. Med., November, 1914.
2. F. C. MCLEAN, Journal Bilog. and Chemistry. 19-1914. P. 38.
3. VAN SLYKE AND CULLEN, Journal Bilog. and Chemistry. 19-1914. P. 215.
4. F. W. PEABODY, Boston Med. and Surg. Journal, August 3, 1916.
5. MOSENTHAL, Archives, Int. Med., November 15, 1915.
6. F. T. ROGERS, Transaction, Amer. Med. Asso. Section in Ophthalmology, 1911.
7. PETER HUNTER THOMPSON, Boston Med. and Surg. Journal, August 3, 1916.
8. BARRINGER, Archives, Int. Med., June 15, 1910.

MEDICAL RESEARCH AND THE GENERAL PRACTITIONER.

Many years ago Armand Trousseau said to his students at the Hotel-Dieu: "An understanding of the natural course of diseases is the most important kind of knowledge which a young physician can seek after. It is with the aid of this compass that he steers with certainty through the complex study of therapeutics, and is enabled to gauge the value of systems which succeed each other, only that they may in turn be speedily crushed by those which arise in their stead." Similarly, Sir Thomas Watson, Sir James Paget, Sir Benjamin Brodie (to mention no others) have drawn attention to the capital importance of this study of the natural history of diseases in guiding the steps of physicians along the difficult road of medicine, strewn as it is with the white bones of so many dead theories. And now comes Sir James Mackenzie reiterating once again the same advice. "The life of a general practitioner," he says, "is not considered one that can help much in the advance of medicine; it is, indeed, regarded so lightly that no steps are ever taken to train one who intends to become a general practitioner in any branch that would enable him to undertake research work. You know well that if a man aspires to research work it is to the laboratories or the hospital work he is sent. As a result of my experience I take a different view, and assert with confidence that medicine will make but halting progress, while whole fields essential to the progress of medicine will remain unexplored, until the general practitioner takes his place as an investigator. The reason for this is that he has opportunities which no other worker possesses—opportunities which are necessary to the solution of problems essential to the advance of medicine." He then goes on to illustrate that the natural history of most diseases, especially in their early stages, has yet to be written, and in this field the general practitioner can pursue research work of enduring value.

We have made really too much of the "objective" signs of disease, and have as yet paid too little attention to those subtle and informing "subjective" symptoms, namely, the patient's sensations. Is it not true that when we can discover objective signs in a given disease we are not then at the beginning of the natural history of that disease? And furthermore, is it not true that the earliest chapters of that natural history are not made up of objective signs at all, but rather of subjective symptoms? Obviously it is; but where in our text-books of medicine shall we look for any adequate account of the functional warnings that so invariably preface, did we but recognize them, the future structural change? The general practitioner is he who meets these early phenomena so valuable in diagnosis; they are not to be found in the laboratory or the hospital ward. The vice of much contemporary scientific medicine is its physical-mindedness. Its world of reality comprises, for the most part, only those things which can be fixed in paraffin and stained with methylene blue. But who will deny that things fixed in paraffin and stained in methylene blue wear the livery not of life but of death? We shall then refuse too readily to accept the dictum that only that is worthy of the name of research work which is done in the laboratory or the hospital ward. Our medical philosophy must be more comprehensive than that; and we shall claim the right to call any honest work research work wheresoever and by whomsoever, it is accomplished. Every journal of medicine would then be a Journal of Research Medicine.

What multifarious opportunities for useful investigation we open to the general practitioner! What is the significance of pain of different quality and intensity and localization? What is the meaning of blood-pressure and what its upper and lower limits compatible with health? What changes in character and hence in conduct are noticeable in those who are later to become nervous or insane? What are the precise conditions of modern life which are producing such a large increment of vascular, renal and cardiac disorders? These and many other questions are pressing for answers, but answers we have few or none that is based upon prolonged and careful observation. Jenner might have spent a life-time in hospitals and laboratories without discovering the efficacy of vaccination, because the opportunity simply would not have been there. Robert Koch was a general practitioner at Wollstein when he worked out the complete life-history and sporulation of the anthrax bacillus—work which made so many laboratories necessary. In England Hughlings Jackson laid the foundation of British neurology without ever having performed a laboratory experiment; and Sir James Mackenzie himself was a busy general practitioner in Burnley when he made those thousands of careful records which became the splendid foundation of his great work upon the heart. And so we might go on proving from the history of medicine the epochal work that may be done by men whose days and nights are spent in sick-rooms. Not lack of opportunities, but our native human inertia is the explanation of our unproductiveness. So after all it rests with us whether our opportunities shall be stepping-stones to medical achievement.

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EDITORIALS

MORE MEN FOR THE MEDICAL RESERVE CORPS.

It is evident that the local profession is not sufficiently impressed with the fact that we are engaged in a real war. Physicians are not applying for admission to the Medical Reserve Corps in any such proportion as the gravity of the situation demands. In the examinations held recently, the smaller cities of the state have furnished a much larger quota of medical men in proportion to the number of physicians than has Providence.

This is an unusual opportunity, especially for the younger men. It is a privilege to serve your country, and at the same time gain a remarkable experience. Volunteer army surgeons have always been men of mark, and have usually attributed their success in later life to the experience gained in military hospitals. But it is not of one's opportunities that we wish to speak. The country needs us, and we shall all be called upon to make some sacrifice before peace dawns upon a harassed world. If an army of 2,000,000 men is to be raised, more than 20,000 physicians

will be needed. Throughout the entire country, only a small proportion of this number have signified their willingness to join the Medical Reserve Corps. Those who are in close touch with the authorities in Washington realize that the international situation is regarded as very serious. In case medical men do not apply for admission to the Medical Reserve Corps at a faster rate than they are doing at present, there is no doubt that a law will be passed which will mean practically conscription of eligible physicians.

"Is the spirit of '76 and '61 dead?" We do not believe it. The medical profession as a whole has never yet failed to rise to its opportunities. We are sure that the greatest crisis this country has ever seen will not find us wanting in a willingness to serve in any capacity where we can do the most good.

SCIENTIFIC FEEDING OF THE PEOPLE IN WAR TIME.

Much is being said and written in these anxious times concerning the conservation of food, and the necessity for planting a greatly increased acreage in this country in order to offset the losses occasioned by decreased planting in Europe, by submarine activities and by poor crops. More important than the conservation of food, necessary as that is known to be, is the proper nutrition of the people. This can be accomplished by an intelligent supervision of the dietary, so that the greatest number of caloric units may be obtained from the smallest intake of food, and the elimination of expensive foods and those of low caloric value. The greater necessity of proper nutrition for everyone in these times of unusual stress has been appreciated by local organizations of which the Housewives' League is an example. In conjunction with other organizations working along similar lines, a series of demonstrations on the proper selection of a dietary are being planned at neighborhood clubs, factories and department stores.

This is a line of endeavor in which physicians can be of especial help. It should be a patriotic duty for us to offer gratuitous advice on the proper feeding of the family in every home we visit. We can outline a proper dietary producing the greatest caloric value which will at the same time be palatable and help to conserve to the utmost the food supply of the country. Special attention should be paid to the diet of babies and growing children in order that the unfortunate experience of some European countries shall not be repeated in this country. It is more important than ever before that our milk supply shall be maintained at the highest possible standard.

READ CAREFULLY THE NEW WORKMEN'S COMPENSATION ACT.

There are several changes in the Workmen's Compensation Act as amended at the recent session of the General Assembly which it is well for the profession to understand thoroughly. It is generally known that the employee now has "the right to select the physician by whom, or the hospital in which he desires to be treated." The period during which "the employer shall furnish reasonable medical and hospital services and medicines when they are needed" has been extended from two to four weeks.

There are two other provisions, however, which have not been brought sufficiently to the attention of the profession. It is vitally important that the significance of the following clause be grasped before the law goes into effect on June 1, 1917. ". . . *the physician or hospital shall give written notice to the employer within seven days after the beginning of their services that they have been so selected and shall present their claim to the employer for the payment of such services within three months after the conclusion thereof, but the failure of the employer to receive such notice shall not render the employee liable for such service.*"

It will be seen from the above that the safest plan for the medical attendant to follow, will be always to send his notices to the employer by registered mail and demand a receipt for them. Otherwise, if the notices are lost, the physician has no legal redress, and may be unable to collect his just and proper charges.

LABORATORY DIAGNOSIS.

Mature clinical judgment based on careful history-taking and a conscientious routine physical examination, is now as always the mainstay

of the practitioner in arriving at a correct diagnosis. The proportion of cases, however, in which laboratory examinations are absolutely essential before a final conclusion can be reached is every day increasing. Progress is of necessity slow in bedside medicine compared with the relatively rapid development of laboratory methods and technique. Thus the practitioner is forced to depend more and more on the simpler laboratory tests which he carries out in his own office, and on those which must be performed for him by the trained clinical pathologist.

In attempting to solve the more obscure problems in medicine it is often discouraging both to physician and to patient to contemplate the mass of data which must be obtained and correlated before a decision can be reached. There is, however, no method available other than the painstaking investigation of everything which can have a bearing on the case, the conscientious following of every clue, if guess work is to be eliminated. The practitioner is not trained or equipped to work out the details of many of the necessary tests, but he should at least be trained to recognize their value and their applicability to his problems. The performance of many of these tests represents a highly specialized type of work.

The physicians of Rhode Island are at present in a position to give their patients the benefit of such highly specialized work. Besides the various city, private and hospital laboratories which are available for the use of larger or smaller groups, the laboratory of the State Board of Health is at the service of all registered physicians of the State. The scope of its work as announced two years ago should be well known to all. Many of the more familiar procedures which it carries on, such as the examination of throat cultures for diphtheria, sputum examination for tubercle bacilli, and the Wassermann test, are in constant use. It is to be regretted, however, that the profession does not more freely avail itself of the aid which the laboratory can give it in the performance of many of the somewhat less usual tests, for example, the examination for tubercle bacilli by animal inoculation, the examination for the spirochetes of syphilis by the dark ground illumination method, blood cultures in cases of suspected septicaemia, as in typhoid fever, the bacteriological examination of cerebrospinal fluid, and the examination of pneumococci as to type.

Considering this attempt on the part of the Board of Health to aid the practitioner in making a scientifically correct diagnosis, it is hardly a "square deal" to the public which pays to maintain the laboratory if the physician neglects to take advantage of this aid.

Inasmuch as the practice of modern medicine demands that highly specialized laboratory methods be constantly applied as a means of arriving at a correct solution of its problems, the physicians and public of Rhode Island are to be congratulated on the fact that such assistance is always available.

SOCIETIES

DISTRICT SOCIETIES.

Providence Medical Association.

The regular monthly meeting of the Providence Medical Association was held at the Medical Library on May 7, 1917. The meeting was called to order by the President, Dr. F. E. Burdick, at 8:55 p. m. There were present at the meeting 74 members and 4 guests. Dr. H. G. Partridge was elected President pro tem., as Dr. Burdick was unable to stay for the meeting. The records of the preceding meeting were read and approved. A communication was read from the committee on food conservation of the Housewives' League, asking the coöperation of the Association in the campaign for food conservation in Rhode Island. The plan of the campaign was explained somewhat in detail by Dr. E. S. Brackett.

The following resolution, introduced by Dr. C. O. Cooke by request, was passed:

"As many members of this Association will be called to the colors, thereby making large sacrifices, financially, therefore be it

"*Resolved,* That every physician who is called to the colors shall receive from his colleagues, who attend his practice at home, all of the gross collections, to be paid to the physician or his family monthly, so long as he is serving and until such time as he is able to resume his practice.

"Any patient consulting a physician, who is not one of that doctor's regular patients, is to be asked to state if one of the physicians in the service of the Government is his regular physician, making it clear to the patient why he is asked this question."

Dr. J. W. Keefe called attention to the need of physicians in the Medical Officers' Reserve Corps, and made the announcement that examinations for the same would be held at the Medical Library on May 12, 1917, at 11 a. m.

On motion of Dr. A. T. Jones, duly seconded, it was voted that the Publicity Committee be instructed to publish in the daily press the method of application to the Medical Officers' Reserve Corps, and stating that examinations for the same would be held at the Medical Library on May 12, 1917, at 11 a. m.

The first paper of the evening, entitled "A Study of Acute Respiratory Infections," was read by Dr. H. S. Bernstein. The paper was discussed by Drs. Messinger, Lovewell and W. R. White.

The second paper, entitled "The Recognition and Treatment of Some Painful Conditions of the Anterior Foot," was read by Dr. Edward W. Burt. The paper was discussed by Dr. Hammond.

The meeting adjourned at 10:40 p. m. A collation was served.

CHARLES O. COOKE, *Secretary.*

NEWPORT MEDICAL SOCIETY.

A meeting was held May 17, 1917, at 8:30 p. m., at Historical Society Building. H. G. Giddings, M. D., of the Boston City Hospital, spoke of the Dangers of Drug Store prescribing in Venereal Diseases.

MARY E. BALDWIN, M. D., *Secretary.*

WOONSOCKET DISTRICT SOCIETY.

The regular meeting of the Woonsocket District Medical Society was held at the Woonsocket Hospital April 12, 1917. An interesting surgical clinic was presided over by Dr. Charles L. Scudder of Boston, after which a luncheon was served.

E. F. HAMLIN, *Secretary.*

SECTION IN MEDICINE.

A meeting of the "Section in Medicine" was held at the Medical Library, May 22, 1917, at 8:45 P. M. Paper: "Pneumonia, Prognosis and Treatment," by Dr. J. E. Mowry. Discussion opened by Dr. Jay Perkins.

CHARLES A. MCDONALD, *Secy-Treas.*

SECTION FOR THE DISEASES OF CHILDREN.

The 32nd meeting of this Section was held May 23, 1917, at 9 P. M., in Library Bldg.

Paper: "Review of the Recent Literature on Infantile Diarrhoea," by Dr. Wm. P. Buffum, Jr.

JACOB S. KELLEY, *Sec.-Treas.*

HOSPITALS

RHODE ISLAND HOSPITAL.

On April 19 a flag raising was held, which was attended by all the children who could be moved outdoors. Mr. Amos was master of ceremonies, which consisted principally of the singing of patriotic songs.

The infants' ward of the hospital has been enlarged by the addition of a new wing which will accommodate 18 patients.

The south ward has recently been equipped with a system of cubicles or isolation booths which are stalls with glass partitions so arranged that the children can be effectively separated for several days after admission to the hospital.

The new Out Patient Department building is nearing completion, and it is hoped that it can be opened in June.

About forty members of the staff have either applied for enrollment in the Officers' Reserve Corps of the army or navy or have signified their willingness to make such application.

The members of the Naval Base Hospital Unit, lately organized at the Rhode Island Hospital, were recently examined at the United States Naval Hospital, Newport, for admission to the United States Naval Reserve Force.

The graduating exercises of the Training School for Nurses were held May 23, 1917, at 8:30 p. m. Addresses were delivered by Miss

Lucy C. Ayers, Superintendent of the Woonsocket Hospital, and by Dr. Herbert B. Howard, Superintendent of the Peter Bent Brigham Hospital. The diplomas were presented by Jesse H. Metcalf, Esq., President of the Board of Trustees, to the forty members of the graduating class.

MEMORIAL HOSPITAL.

Dr. Herbert E. Harris has been appointed assistant orthopedic surgeon.

PROVIDENCE CITY HOSPITAL.

Dr. Everett P. Jewett has left the hospital to accept an internship at the Boston Lying-In Hospital.

Dr. Connor has assumed the duties of interne for a service to end July 1, 1917.

Arrangements have been made with the naval authorities at Newport whereby cases of contagious diseases, including tuberculosis, will be cared for in the City Hospital if the necessity arises.

ST. JOSEPH'S HOSPITAL.

The graduating exercises of the Training School for Nurses were held on the evening of May 22 at the Eloise, Franklin street. The class consists of nine nurses. Dr. Arthur H. Harrington of the State Hospital for the Insane delivered the graduation address. The Very Rev. Dr. Blessing, Treasurer of the hospital, conferred the diplomas.

Several members of the staff have indicated their willingness to take examinations for enrollment in the Officers' Reserve Corps of the United States Army.

STATE HOSPITAL FOR MENTAL DISEASES.

The graduating exercises of the Training School for Nurses were held in the Assembly Hall of the hospital May 24, 1917, at 8:15 p. m. An address on "Preparedness" was delivered by Dr. Charles W. Page of Hartford, Conn. The diplomas were presented by Hon. Jesse H. Metcalf.

MISCELLANEOUS

Dr. Murray S. Danforth has left for Washington to join the orthopedic unit which is to sail to Europe for service under the British Government.

Dr. Herman C. Pitts has recently returned from service in France, where he was one of the surgical staff of the Harvard Unit.

Dr. Frederick J. Farnell has removed his office from 335 Angell street to 59 Blackstone boulevard.

BOOK REVIEW

THE STARVATION TREATMENT OF DIABETES. By LEWIS WEBB HILL, M. D., and RENA S. ECKMAN. W. M. Leonard, Publisher. 3rd Edition, pp. 134. Price $1.50.

In no branch of medicine has there been more radical change than in the treatment of diabetes. Our knowledge of the underlying physiological and pathological causes has been more crystallized in the past few years. Our ideas of the chemotherapy of the disease have landed us high and dry on the shores of therapeutic nihilism. No longer are we prescribing this drug or that gland extract. Even sodium bicarbonate has been relegated to the "limbo of the patriarchs." While no doubt the last word has not yet been said on the subject, we have, at any rate, advanced far in the practical treatment. To Dr. Allen we owe much of our recent enthusiasm and success in its management. Several useful books have appeared lately. The book before us is a little handbook that has run into its third edition. This edition has the valuable addition of the analyses of "diabetic foods" tested out by the Connecticut Agricultural Experiment Station. Here ready reference is found to the delusion as to gluten flours. The popular idea of the low starch content is here refuted in percentage figures. The first pages are given over to the description of the treatment of a type case. Then follow citations of cases and urine tests for sugar. Then follows a most instructive lot of diet lists with graded tables from day to day for the recent convert from glycosuria. A useful collection of recipes of varied and palatable kind is given, together with a handy reference set of tables of food values. All in all no more compact, meaty compendium can be found. The well informed patient could well be entrusted with it.

G. S. M.